

KODAK*photo notes*

for registered owners of the
Kodak Reference Handbook
and the
Kodak Photographic Notebook

Fine Grain and The New Emulsions

Ever wonder why a friend's enlargements consistently show less graininess than yours (even after trying his "special" developer-film combination)? Perhaps you've begun to suspect that he's practicing some sort of witchcraft. However, before you mentally burn your friend at the stake, we assure you that developer and film are only a part of the story and the making of fine grain enlargements is the result of "know-how," not "hocus-pocus."

First of all, the graininess which you may notice in an enlargement is caused by the irregular distribution of the silver grains in the negative image. The degree to which this unevenness becomes noticeable or objectionable is affected by a number of factors, among which are:

1. The type of emulsion,
2. The amount of exposure,
3. The type of developer and degree of development,
4. The type of paper used to make the print,
5. The degree of enlargement and type of enlarger,
6. The kind of tones in the picture and the amount of detail,



7. The sharpness of the negative, and
8. The sharpness of the print.

As you can see, then, there has been a tendency to place too much importance on the emulsion and developer as they affect graininess.

Perhaps at this point it would help clear up some of the cloudiness surrounding the subject if we reviewed each of the above factors as they apply to the new Kodak emulsions. **Emulsion Type.** For emulsions of a given general type, graininess tends to increase with the emulsion speed—the faster the emulsion the coarser the graininess and, conversely, the finer the graininess the slower the emulsion. The advent of the new emulsion making techniques has improved this relation considerably.

These new emulsions are either faster (more sensitive) for a given graininess or they have much finer grain for a given speed. For example, Kodak Royal Pan or Tri-X Films are at least twice as fast as Kodak Super-

XX Films and yet show no more graininess.

Exposure. A heavy (dense) negative shows more "graininess" than a thin one. As we pointed out in previous *Photo Notes*, a published exposure index must contain a big safety factor to take care of many variables so that most of the users will get satisfactory results. We also pointed out that if your negatives were consistently heavier than you preferred, you should decrease the exposure until your negatives suited you. This is especially important if you want negatives of the finest grain.

Development. Here, again, as with overexposure, overdevelopment will increase graininess. If the aim is to get fine-grain negatives of average contrast which will be enlarged in a diffuse type of enlarger, the gamma should be between about 0.7 and 0.8. Many who use small negatives in condenser-type enlargers prefer a lower gamma, about 0.55 to 0.65. Both subject contrast and lighting contrast also affect selection of the best gamma. A subject with low contrast or lit by a flat, even light may require an increase in development contrast.

Most normal or conventional developers produce about the same graininess when the degree of development is the same, but effective fine grain developers such as Kodak Microdol Developer can produce a decided improvement.

Paper Selection. "Graininess" shows up most in a smooth, glossy paper; least, in a rough surface paper, such as tapestry or tweed.

Enlarging. It goes without saying that the greater the degree of enlargement, the more graininess will become apparent. This is also affected by the

type of enlarger used. Condenser-type enlargers increase print contrast and sharpen up "graininess" so that it becomes more noticeable. Diffuse-type enlargers minimize this effect. **Subject.** The subject matter has a lot to do with how much graininess we notice. A picture with broad smooth tones will show up the graininess much more readily than one with lots of detail. The sharper the negative image, as a result of proper focusing and camera operation, the sharper will be the picture detail and the less noticeable the graininess.

Print Sharpness. The graininess pattern can be subdued if the enlarged image is slightly diffused or not focused perfectly sharply, but will also cause a loss in picture sharpness.

If you will pay reasonable attention to these factors, particularly to avoiding overexposure or overdevelopment, the new Kodak films will give you enlargements you would never before have believed possible*—and without objectionable graininess.

**P.S. Speaking of unbelievable enlargements, page 4 of the last issue of Photo Notes had one. If it stymied you as it did one reader who wanted to know just what new and revolutionary lens we used to get such sharpness and quality at 32 times magnification, here's the answer.*

What you actually see is a 12-14 times enlargement which was originally 32 times (and still quite good and quite acceptable) but was reduced somewhat in fitting the picture to the page, thereby changing the magnification. Incidentally, the original scene at left was not taken from the entire negative area. If it were, the enlarged portion we show would then be only about 8 times magnification.

NEW

Dual-Purpose Packaging For Kodak Filters

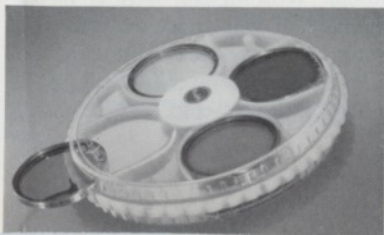
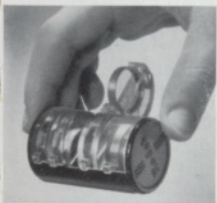
Kodak Bayonet Filter Cases, molded from our own tough Tenite plastic, not only protect the filter until you get it, but continue right on working for you. All Kodak Series 4, 5, and 6 filters not supplied in kit form (described below) are now packaged

in these transparent cases which are provided at no extra cost. You can tell at a glance which filter is inside and it's easily removed by pushing the sliding panel open by means of a knurled handle on the side. They can also be joined together, by engaging the threads on either end, to build compact kits to suit your particular needs. Finish your kit by attaching the adapter ring case, threaded on the bottom only, on the end of the "stack." Bayonet Filter Cases are not available separately.

Kodak Filter Kits provide a very compact single-unit case (also made of clear Tenite), an adapter ring, and certain basic filters for any camera which uses series 4, 5, or 6 size filters. Certain basic sets are stocked by your dealer or he can make up a kit containing the filters you would like. Filters are readily identified through the transparent swing-out compartments. Detents keep the filter from

falling out as the compartment swings open and a safety snap locks the compartment in its closed position. When purchased as a complete kit the case costs you nothing, you pay only for the contents; however, cases for 4 filters and an adapter ring are available separately at the following list prices: Series 4, \$1.50; Series 5, \$1.95; and Series 6, \$2.50. Cases for 6 filters are available in Series 4 and 5 at \$1.50 and \$1.95.

New Kodak Retina Lens Accessories designed especially for use with the new Kodak Retina IIc and IIIC Cameras are now being offered by your dealer. The new accessories include screw-in type filters, slip-on lens hoods, filter compartment case, and a unique 8-filter transparent pocket case. The filters are of two sizes, 32mm and 60mm, and attach directly to the Retina lenses. The 32mm filters fit the standard 50mm taking lens and the 35mm wide-angle component while the telephoto component accepts the 60mm filters. The 32mm filters, which come packed in individual transparent cases, can be left in place when closing the camera, overcoming an objection Retina owners have had in the past.



BETTER FLASH



With the new Improved **SUPER M2**

The M2 flash lamp, the popular peanut-sized bulb that started a minor revolution in flash photography a couple of years back, is now available in a new, improved version. The biggest change is that the new "super" M2 has a lumen-second output of about 7000 as compared to 4500 in the old lamp. In other words, the new lamp gives approximately 66% more light. With more light it means that the super M2, when used in a reflector designed for it (such as found on the Kodak Super-M Flashholder), will give you guide numbers which are only about 1 stop lower than you would use with a larger reflector and a No. 5 or 25 lamp.

Color Temperature

Another big improvement has been introduced by most of the lamp manufacturers in order to bring the M2s into proper color balance for use with Type F color films. This is being done by coating the lamp with a substance that filters the light emitted by the lamp, thereby lowering color temperature to the proper degree.

Because it is rather difficult to detect this coating and also because it is expected that lamp manufacturers will standardize on these built-in filters, it would be best to check the lamp carton to see if it specifically states that the lamps are properly balanced for use with Type F color films. If it does not, then a filter such as the Kodak Wratten No. 81A is recommended. If you aren't too critical of your color, you may disregard this filter (transparency colors will just be a little bluish or "cold").

Synchronization

The new M2 has a very short flash duration, being about 1/100 of a second. This means, then, that it is somewhat like an SM or SF lamp in its action-stopping power. This, coupled with the increased light output and lower cost, gives the super M2 a decided advantage—and we're thinking especially of the owners of simple cameras using black-and-white film when we say this—over a larger lamp.

When using the M2 with most simple cameras, synchronization of lamp and shutter is usually not a problem because the shutter remains open long enough to straddle the lamp's peak and catch almost all the light. In general, it can be said that any simple camera designed to be used with SM or SF lamps will also work with an M2, while cameras designed for use only with No. 5 or 25s will not.

On other cameras having X or F synchronization and adjustable shutter speeds it is possible to use the M2 only with speeds of 1/25 or 1/30. With cameras such as the Kodak Retinas where you can select synchronization, the F or X position should be used. Again, the shutter speed cannot be greater than 1/25 or 1/30 since at faster speeds the shutter will close before the lamp flashes.

At Higher Speeds

For synchronized flash pictures at shutter speeds of 1/50 and 1/100, a camera such as our Chevron must be used. It features the Kodak Synchro-Rapid 800 Shutter on which various delays between M, F, and X synchro-

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Print Washing Time Cut to 10 Minutes

Progress marches on in the constantly improving techniques for processing sensitized materials. The latest improvement is in the application of the newly introduced Kodak Hypo Clearing Agent to reduce the washing time for prints as well as films. Ordinary washing time for paper is one hour in running water at 65 to 70 F. With the Kodak Balanced Alkali treatment we were able to cut this time in half. Now with Kodak Hypo Clearing Agent we can cut the time for single-weight (or thinner) prints to a short 10 minutes, double-weight paper to 20 minutes. Cost is negligible, 80 cents buys enough to make five gallons of solution.

Permanence Improved

Permanence can actually be improved over that obtained with ordinary washing procedures if the water temperature is maintained at 65 to 70 F. Treatment with Hypo Clearing Agent does not soften the emulsion and will not affect the paper's ability to ferrotype.

Temperature of the wash water has much less effect on the wash efficiency when this new bath is used. The temperature can be as low as 35 F.

It's very easy to use. The simple steps are as follows:

FOR PAPERS:

1. Dissolve the contents of the 5-gallon size in 4 gallons of water at 80 F. Then add water to make 5 gallons of solution.
2. Fix (two-bath fixing is recommended) normally, do not *over-fix**, then immerse prints in the Hypo

Clearing Agent Bath, with or without a previous rinse. More prints can be treated if they are rinsed after fixing. Treat 2 to 5 minutes in Hypo Clearing bath at 65 to 70 F for single-weight or thinner prints, 3 to 5 minutes in Hypo Clearing bath for double-weight prints.

3. A higher degree of stability than can be obtained under normal recommended washing conditions (1 hour at 65 to 70 F) will result from treating prints as above followed by a washing of the prints at 65 to 70 F for the following minimum times with normal agitation and conditions of water flow:

Single-weight or thinner 10 min.
Double-weight 20 min.

However, the same stability obtained under normal recommended washing conditions (1 hour at 65 to 70 F) may be obtained by treating prints in Hypo Clearing Agent as directed above, followed by washing in cold water, which can be as low as 35 F, for the times specified above. If prints are to be toned, two-bath fixation is especially necessary when washing with cold water.

Capacity of Hypo Clearing Agent Solution

No more than 50 8 x 10-inch prints (or equivalent) should be treated per quart of solution when an intermediate rinse is used after fixation. If an intermediate rinse is not used, a limit of 20 such prints applies.

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*If prints are left in the fixing bath too long, the hypo seems to penetrate and become adsorbed to the paper and is then very difficult to wash out. Prolonged fixing can also change the image color and tends to bleach out some of the highlight detail.

Potpourri

The guide numbers for the new Kodak films for portable electronic flash units are given in the following table:

GUIDE NUMBERS FOR KODAK FILMS WITH PORTABLE ELECTRONIC FLASH UNITS

KODAK FILM	DAYLIGHT EXPOSURE INDEX	EFFECTIVE CANDLEPOWER-SECONDS OUTPUT OF UNIT									
		350	500	700	1000	1400	2000	2800	4000	5600	8000
Plus-X (35mm) Verichrome Pan	80	45	50	60	70	85	100	120	140	170	200
Kodak Tri-X, Roll	200	65	80	95	110	130	160	190	220	260	320
Panatomic-X	25	24	28	35	40	45	55	65	80	95	110
Kodachrome, Day- light Type	10	15	18	20	25	30	35	40	50	60	70
Ektachrome (E-2), Daylight Type Kodacolor, Universal	32	26	32	40	45	55	65	75	90	110	130

A growing group of color photographers are those who like to make large, luscious $2\frac{1}{4} \times 2\frac{1}{4}$ Ektachrome transparencies for viewing, printing, graphic reproduction, or projection. For their $1\frac{1}{2}$ -inch square (38x38 mm) slides in 2x2 mounts they're finding the Signet Projector ideal. The reason is simple. It was designed to project 828 slides, which are 28x40 mm, either vertically or horizontally without corner cut-off.

Kodak Portra and Telek Lenses will in the future be Lumenized to minimize reflections under extreme lighting conditions. This does not apply to filters as our tests show that coating a flat glass surface which is to be placed in front of the lens makes no significant difference.

If you like to process your own 35mm Ektachrome but are sans darkroom because of lack of space or perhaps because you're away from your favorite haunt on vacation, then lend an ear. The new Kodak Ektachrome Processing Outfit, 35mm, contains all you need to practice Ektachrome alchemy *without* a darkroom. To wit: Kodak Day-Load Tank, stirring paddle, glass thermometer, 2 film clips, Ektachrome Processing Kit, graduate, 6 different colored spill-proof 16 oz. polyethylene containers, 100 Kodak Ready-Mounts, 2 trimming guides, 4 Kodaslide Boxes, instruction manual. Low cost even by medieval standards, the outfit lists at just \$24.75 at Kodak dealers.



M2 Bulbs

(Continued from page 4)

nization can be introduced. When using M2s with the Chevron, best synchronization is obtained with the synchronizing lever set $1\frac{1}{2}$ dots below F, towards M. However, even at this precise setting we can't recommend using a shutter speed faster than 1/100 of a second because M2s vary

in peaking time. One manufacturer's lamps peak at 12-13 milliseconds, another's at 15, and still another's at 18.

Below is a table of guide numbers for using the new super M2 lamps with Kodak films. Note that the last column indicates distance settings for use with simple-type cameras. These numbers are based on averaged characteristics of the lamps available.

SHUTTER SPEEDS	1/25 or 1/30	1/50	1/100	FOR SIMPLE CAMERAS
Color Films				
Kodachrome (F)	65	65	60	
Kodacolor	80	80	75	5-6 ft
Ektachrome (F)	80	80	75	
Black-and-White				
Panatomic-X	70	70	65	
Plus-X, 35mm	130	130	120	
Verichrome Pan	130	130	120	6-16 ft
Tri-X	200	200	190	9-25 ft

Print Washing

(Continued from page 5)

Prints Exposed to Oxidizing Atmospheres

Prints exposed to oxidizing gases may fade, and the use of Kodak Hypo Clearing Agent will not prevent this from occurring. Prints to be subjected to these conditions can be protected by the addition of Kodak Rapid Selenium Toner to the Hypo Clearing Agent solution as outlined in the following technique. In this case, with certain warm-tone papers such as Kodak Athena, Ektalure, and Opal there may be a slight change in tone.

Technique: 1. To each quart of working solution add $\frac{1}{8}$ fl. oz. of Kodak Rapid Selenium Toner stock solution. Stir until solution is well mixed.

Caution: Selenium salts are hazardous. Note warning on label of toner.

2. After fixing normally, transfer the prints to the Hypo Clearing Agent bath without rinsing. A rinse may cause stain in this procedure.

3. Treat for 2 to 5 minutes for single-weight or thinner papers and 3 to 5 minutes for double-weight papers at 65 to 70 F with agitation.

4. Wash single-weight or thinner prints at least 10 minutes and double-weight prints 20 minutes at 65 to 70 F with agitation, and the normal flow of water (enough to fill tank or tray 10 to 12 times an hour).

FOR FILMS:

As previously announced, this time-saving marvel can also be used to reduce washing times for negatives. For more complete information for use with films see the directions on the Kodak Hypo Clearing Agent package.

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THE BOOK SHELF



Copying (Fifth Edition). This data book has undergone a major revision and should now be used to replace the fourth edition found in the Kodak Reference

Handbook, Volume 2. It has been brought up to date to include information on the new films and, in addition, now includes information on applicable films (such as the Kodalith type) and suitable printing papers. List price, \$.50 at Kodak dealers.

Kodak Master Photoguide. A new, up-to-the-minute edition and a complete revision which now includes information on all the new Kodak films. The outdoor dial and the photo-flood dial have been completely redesigned. The flash tables include ex-

posure recommendations for the brand new increased-intensity M2 flash lamp. Other data on the new films includes exposure indexes, exposure for unusual situations, etc. A must for any amateur who takes his picture taking seriously. List price is still just \$1.75 at your dealer's.

Picture It in Stereo. A new, colorful book with an easy-going approach to better stereo pictures. Designed for the amateur, this practical book is chock-full of important pointers telling how to get the greatest "3-D" effect from any picture situation.

The fundamental rules for good pictures are covered, including simplified focusing, close-ups, camera settings for daylight and flash, and pictures by daylight plus flash. 32 pages, illustrated; list price, 50 cents at Kodak dealers.

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